

Patent Claims

1. A device for position and/or length determination, comprising a carrier unit with an absolute magnetic length coding and a measuring unit that cooperates with the carrier unit and can be moved in relation to the latter, said measuring unit having a magnetic sensor unit (Sci, Sfi) and being able to be connected to an electronic evaluation unit (18 to 32) that is located downstream of said measuring unit,

characterized in that

the elongate and rod-shaped carrier unit (10) is provided with one track of preferably radially magnetized length coding,

a plurality of coding sections with a regular pole division is provided along the length coding

and coding sections of a first polarity are arranged to alternate with coding sections of a second polarity along the carrier unit in such a way that a maximum of two coding sections of the same polarity lie directly adjacent to one another.

2. The device as claimed in claim 1, characterized in that the length coding is produced as binary coding on the basis of a binary pseudo-random sequence of predetermined word length, wherein behind each bit of the pseudo-random sequence there is inserted a bit of inverted value, so that the length coding has a length twice that of the pseudo-random sequence.

3. The device as claimed in claim 1 or 2, characterized in that the magnetic sensor unit is designed such that it can detect a respective polarity of a plurality of coding sections which are each spaced apart from one another by a distance of twice the smallest pole division.

4. The device as claimed in claim 2 or 3, characterized in that the plurality of coding sections corresponds to the word length plus 1 of a binary pseudo-random sequence as a basis for the length coding.

5. The device as claimed in one of claims 1 to 4, characterized in that a plurality of scanning sensors of the magnetic sensor unit is assigned to a coding section corresponding to the smallest pole division, wherein selection means are provided for selectively selecting one of the plurality of scanning sensors for evaluation by the electronic evaluation unit, said scanning sensors being designed to detect a transition between the first and second polarity between two adjacent coding sections.

6. The device as claimed in claim 5, characterized in that the selection means comprise at least five interpolation sensors (Sfi) which are arranged at regular distances from one another such that the distance between a first and a last of the series of interpolation sensors is more than twice the pole division.

7. The device as claimed in one of claims 1 to 6, characterized by means for fine position determination within a coding section or a pole division, said means being designed to detect a course of the magnetization along the coding section in the longitudinal direction of the length coding and to determine a distance-proportional interpolation signal therefrom.

8. The device as claimed in claim 7, characterized in that the means for fine position determination are embodied as an MR sensor that cooperates with the magnetic sensor unit and scanning sensors provided therein, which MR sensor determines the interpolation signal from the magnetization course.

9. The device as claimed in claim 7 or 8, characterized in that correction means are assigned to the means for fine position determination, said correction means being designed to correct and/or compensate output signals from the means for fine position determination in relation to an idealized and/or predetermined course along the coding section.

10. The device as claimed in one of claims 1 to 9, characterized in that the carrier unit (10) comprises a preferably metallic elongate sleeve element (70) in which a plurality of individual magnets (72) are held, the dimensions of which, in the axial direction of the sleeve element, correspond to the pole division.

11. The use of the device as claimed in one of claims 1 to 10 in an autoreferential system for length measurement, in particular for use in a machine tool or a materials-handling or conveying system.

12. A device for position and/or length determination, comprising a carrier unit with an absolute magnetic length coding and a measuring unit that cooperates with the carrier unit and can be moved in relation to the latter, said measuring unit having a magnetic sensor unit (SCi, SFi) and being able to be connected to an electronic evaluation unit (18 to 32) that is located downstream of said measuring unit, characterized in that the carrier unit has the magnetic length coding as a preferably circular closed curve and a plurality of coding sections with a regular pole division is provided along the length coding and coding sections of a first polarity are arranged to alternate with coding sections of a second polarity along the carrier unit in such a way that a maximum of two coding

sections of the same polarity lie directly adjacent to one another.

KEY TO FIGURES

u.s.w. = etc.

bis = to

KOMP = COMP

hochauflösende Position, Periode 4mm oder 8mm

= high-resolution position, period 4mm or 8mm